Installation Guide

V1.0 Sept 2011

AIW350E

Invisible Loudspeaker

TECHNOLOGIES Ltd

EVOLUTION SERIES

Caution: Read before installing this product

- To ensure optimal performance, please read this guide carefully and keep in a safe place for future reference.
- Install this product in a cool, dry, clean place - away from direct sunlight and heat sources, vibration, chemical fumes, dust and moisture (steam).
- Do not expose this product to sudden temperature changes or locate it in an environment with high humidity. This is to prevent condensation forming inside which may cause damage to the product.
- Do not clean this product with chemical solvents as this may damage the finish. Use a clean, dry or damp cloth.
- Ensure that all installation mounting surfaces are able to support the weight of the product.
- After installation, avoid pushing on the wall or ceiling surface immediately in front of the speaker. Excessive excursion, whilst unlikely to damage the speaker, will undoubtedly crack the plaster around its perimeter.
- Do not attempt to modify or repair the product. Contact your distributor or manufacturer if a fault should occur.
- The rear of the product should not be subject to chemical cleaning and should not be painted in any way.

ENVIRONMENTAL:

Before installing, ensure that the building is environmentally sealed, de-humidified and at a stable temperature of at least 16 degrees centigrade (61 degrees farenheit)

Please be aware that when this product is directly fitted into a solid wall structure (e.g when using the solid wall backbox) vibrational energy is inevitably transferred into the solid wall structure. This energy can travel for some considerable distance up, down and along the structure. It is therefore recommended the product be fitted within acoustically insulated stud walls or ceiling sections where possible. The use of the product directly embedded in solid walls is not recommended in multi occupation buildings.

WARNING:

No attempt should be made to install this product within existing building structures unless you are certain that no electric cables, water pipes, gas pipes or supporting joists will be cut through.

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Message from the Managing Director

Congratulations and thank you for purchasing an Amina Technologies AIW350E high performance invisible loudspeaker.
At Amina we are proud of being at the forefront of flat panel loudspeaker technology. All the components that make up your AIW350E have been developed specifically to provide the ultimate in sound quality and reliability, while allowing you to decorate, furnish and enjoy your home in any way you wish without any visible "clutter" from your audio system.
At the heart of an AIW350E is our high performance vibrational panel driver. Featuring a unique high power neodymium magnet motor system. This enables the product to provide high quality, high sound pressure levels from such a compact design. Please take a moment to read this guide which will help you achieve the best possible performance from your product.

Thanks and enjoy listening.

Richard Newlove
MD - Amina Technologies Ltd

About the manufacturer

Amina Technologies Ltd is the world's leading designer and manufacturer of truly invisible loudspeaker solutions. Their invisible loudspeakers have been used in a wide range of both commercial and residential applications for over twelve years.
Exclusive hotel spas, fashion retail outlets and stunning private residences have all benefited from using Amina invisible loudspeakers. Amina has the discreet solution ideal for architects, interior designers and all design conscious clients.
See their website for more details about Amina and a selection of prestigious projects completed using our products.

Our high power neodymium magnet structures

Included in the carton

Please check that your carton contains the correct accessories.

Model Number	Single	Pair
AIW350E	1x AIW350E Loudspeaker 1x APU2 1x Spacesaver	2x AIW350E Loudspeaker 1x APU2 2x Spacesaver
AIW350En	1x AIW350E Loudspeaker 1x Spacesaver	2x AIW350E Loudspeaker 2x Spacesaver

Packaging

CAUTION:
Take care when removing the speakers from the carton.

The packaging for the AIW350E has been carefully designed to protect the product during transit. Please retain it in the unlikely event you need to return the product to your dealer or manufacturer. Please recycle the packaging should you wish to dispose of it.

The AIW350E outer carton is made up of 80% recycled single wall board.

How to use this manual

The following pages contain step by step advice to help you achieve a successful installation of your AIW350E loudspeaker
AIW350E loudspeakers can be installed into walls or ceilings of various construction types. This installation guide covers the two basic building construction types; plasterboard cavity walls/ceilings and brick/concrete walls/ceilings. For other construction types please contact Amina.

Cavity wall or ceiling
This is the most common type of installation and requires you to use the Amina BackboxFS (sold separately) or our basic fixing block kit. Whenever possible we recommend you use the BackboxFS as the AIW350E has been tuned to work optimally in this setup. The backboxFS also reduces (although doesn't entirely stop) the rearward sound output of the AIW350E which is important when considering the amount of sound transmission that is acceptable through to adjacent rooms/properties.

Solid wall or ceiling
For installation into brickwork or concrete you will need to pre-install an Amina BackboxSW (sold seperately). When the BackboxSW is installed according to this guide it will position the speaker correctly and securely in the wall/ceiling, ready to be plastered over.

The details below and the flow chart on the opposite page will allow you to select the correct installation steps to follow for your particular type of installation.

Section A *:* Preparing the wall / ceiling and fixing the product

In this section, select the type of installation you will be carrying out and begin from the start page given. This will direct you through the stages, step by step.
Throughout the step by step process, reminders will advise you to view specific pages within Section B. At this point you will need to ascertain the specific page that best matches your installation requirement within this section (i.e is it a retrofit installation or a new build?).

Section B *:* Alignment and plastering preparation

Section B is the reference section which is to be used in conjunction with Section A. Please ensure the correct alignment and plastering method for a retrofit installation or a new build is followed. Reminders on each page throughout Section A will guide the installer to the correct reference page.

Section C *:* Testing

This section advises you on the correct procedures for speaker testing.

Section D *:* Finishing

This section covers plastering and decorating once your speaker has been installed correctly. It may again be necessary to refer to Section B in order to apply the correct plastering method.

Installation overview

Section A — Preparing the wall / ceiling and fixing the product

Cavity installation
Typically a new build or full refurbishment (wall/ceiling)
Start at page 05

Cavity installation with backbox
For new builds or full refurbishment where sound transmission needs to be reduced (wall/ceiling)
Start at page 08

Solid structure installation with backbox
New builds where the wall/ceiling has not been rendered or plastered
Start at page 11

Section B — Alignment and plastering preparation

Cavity installation

Retrofit patch plastered
For walls/ceilings that have already been plastered
Page 14

Retrofit feathered skim
For walls/ceilings that have already been plastered
Page 15

New Build
For new plasterboard walls/ceilings that have not yet been plastered
Page 16

Retrofit drywall patch plastered
For new drywall walls/ceilings that will be taped and joined
Page 20

Retrofit drywall feathered skim
For new drywall walls/ceilings that will be taped and joined
Page 21

Solid installation

Retrofit feathered skim
For solid walls/ceilings that have already been plastered
Page 17

Retrofit patch plastered
For solid walls/ceilings that have already been plastered
Page 18

New Build
For solid walls/ceilings that have been rendered but not yet plastered
Page 19

Section C — Testing

page 22

Section D — Finishing

page 23

05

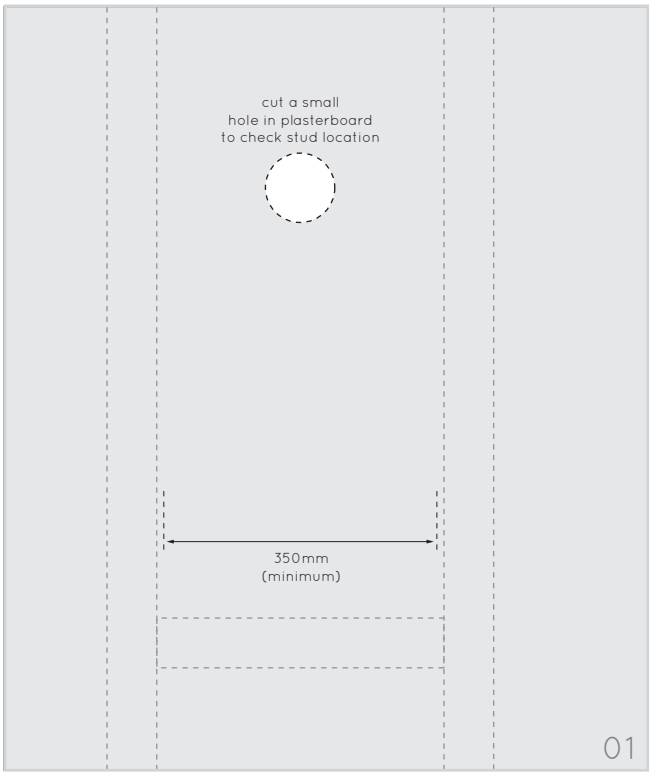
Cavity installation

A

Typically a new build or full refurbishment.
Uses fixing blocks (sold seperately)

01 Locate joist work

When you have chosen your speaker locations, before cutting a hole in the plasterboard it is important that you locate the position of the wall studs. Ensure the spacing between them is at least 350mm (13 3/4").



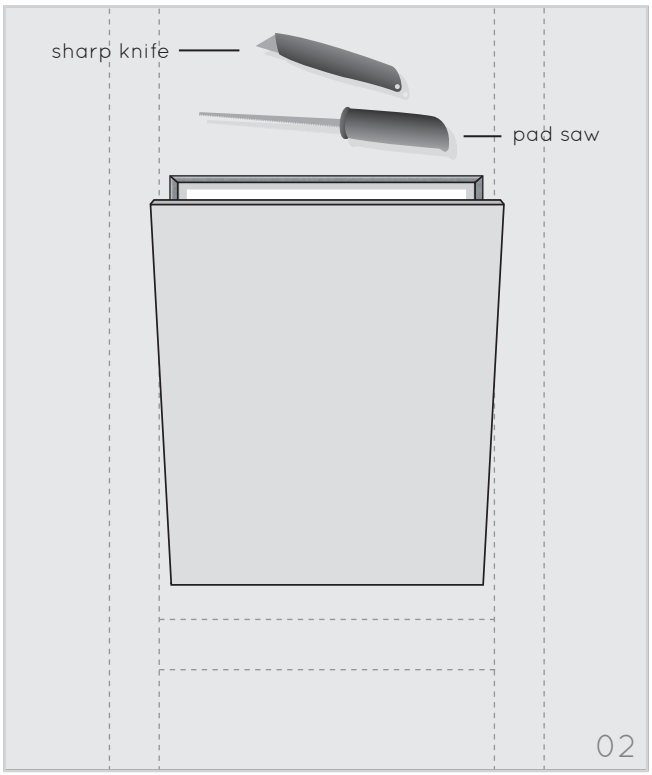
SPACESAVER:
The supplied Spacesaver may be used to show the position of the speaker pre-install by securing it to the wall.
Secure the speaker cable to the Spacesaver before any building electrical inspection.
See page 30 for full details.

02 Create 455 x 350mm aperture

Using a sharp knife or pad saw, cut an aperture with dimensions 455mm x 350mm (18" x 14") in your plasterboard wall or ceiling. Ensure aperture is created between supporting joists or stud work.

We strongly advise that joists are not cut to make space for the backbox. Any activity of this sort may well influence the structural integrity of your property.

Important: Double check the size of the aperture is 455mm x 350mm (18" x 14") as this is important further on into the installation process.



*Reference pages for correct **retrofit** alignment and plastering method: **14 + 15***
*Reference page for correct **new build** alignment and plastering method: **16***
*Reference pages for correct **drywall** alignment and plastering method: **20 + 21***

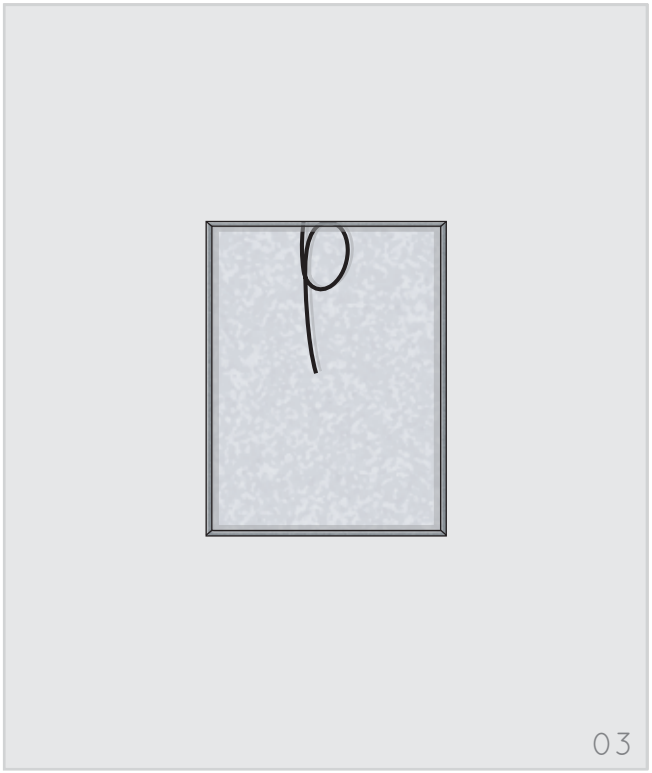
Cavity installation continued...

A

03 Install speaker cable and insert insulation

Ensure all speaker cables are pulled through to the speaker location with plenty of slack. This will make it easier to connect the cable to the speaker later on in the installation process.

It is recommended to add sound absorbing mineral wool inside the cavity to reduce sound transmission behind the speaker and limit cavity resonances.

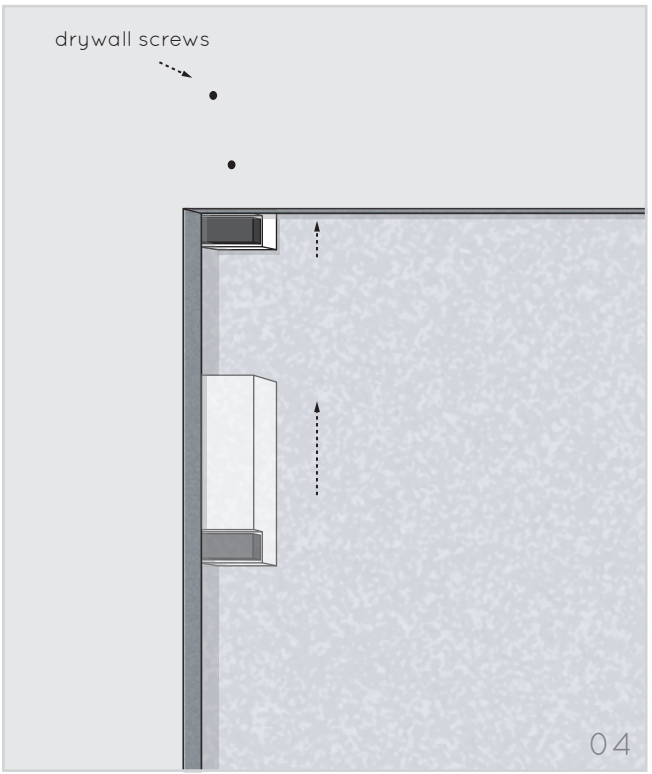


04 Attach fixing blocks (x4 per speaker)

Position a fixing block under the plasterboard at each corner of the aperture. Fasten the thicker section of the fixing blocks to the underside of the plasterboard using two drywall screws secured through the front face of the plasterboard.

NB: ensure there is no gap between the fixing block and the sawn edge of the plasterboard aperture.

Important: The fixing blocks are designed for 12.5mm (1/2") plasterboard (1/2" and 5/8" in North American markets).
Please contact your supplier if you require fixings for an alternative plasterboard thickness.



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*Reference pages for correct **drywall** alignment and plastering method: **20 + 21***

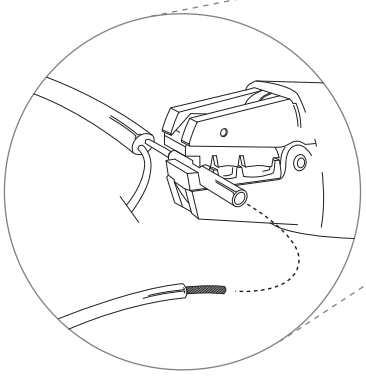
Cavity installation continued...

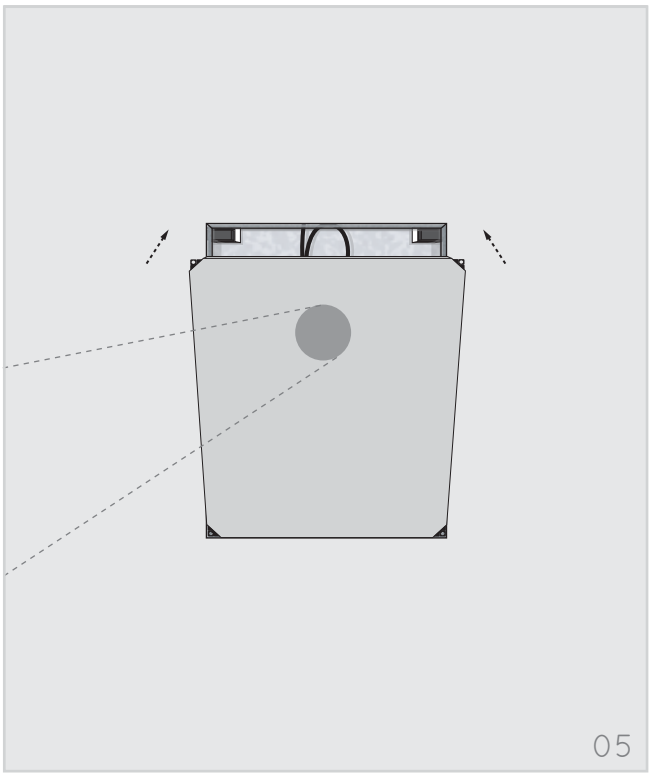
A

05 Connect the AIW350E speaker

Connect the speaker cable to the speaker using a high quality crimping tool.

Your AIW350E speaker is fitted with blue butt splice crimp connectors which are suitable for speaker cable thicknesses of 1.5mm^2 - 2.5mm^2 (16 - 14AWG). This type of connector ensures a permanent connection is created inside your wall cavity.





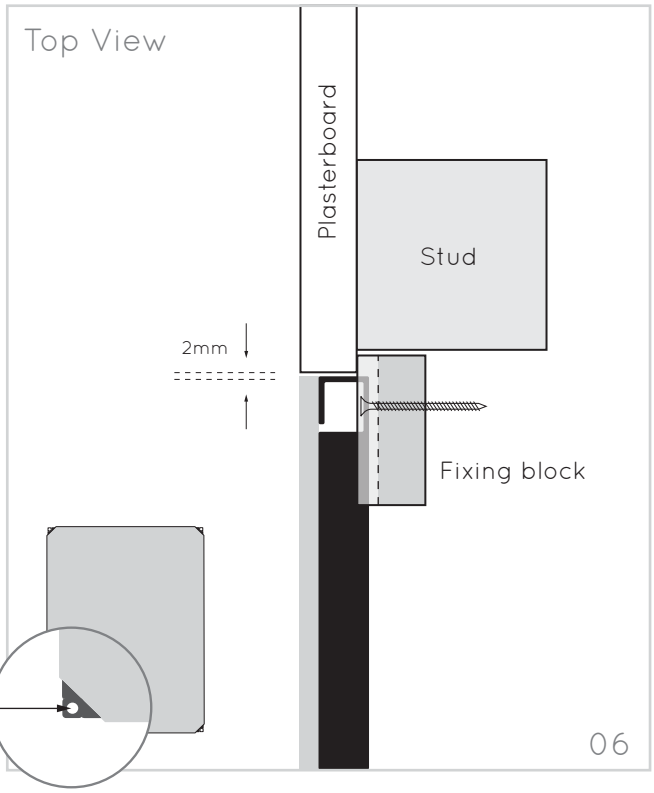
06 Secure the speaker to the fixing blocks

Important: Ensure there is an all around gap of 2mm between the speaker and the plasterboard. If necessary, increase the aperture size before mounting the speaker.

Using drywall screws, fix the four corner points of the speaker to the fixing blocks. Pilot holes are not necessary as drywall screws will easily self tap into the fixing block.

Ensure the front face of the speaker rests in a position flush with the front of the plasterboard and that it is firmly held in position.

Continue on to Section C (page 22 - testing)



*Reference pages for correct **retrofit** alignment and plastering method:* ***14 + 15***
*Reference page for correct **new build** alignment and plastering method:* ***16***
*Reference pages for correct **drywall** alignment and plastering method:* ***20 + 21***

Cavity installation with backbox

A

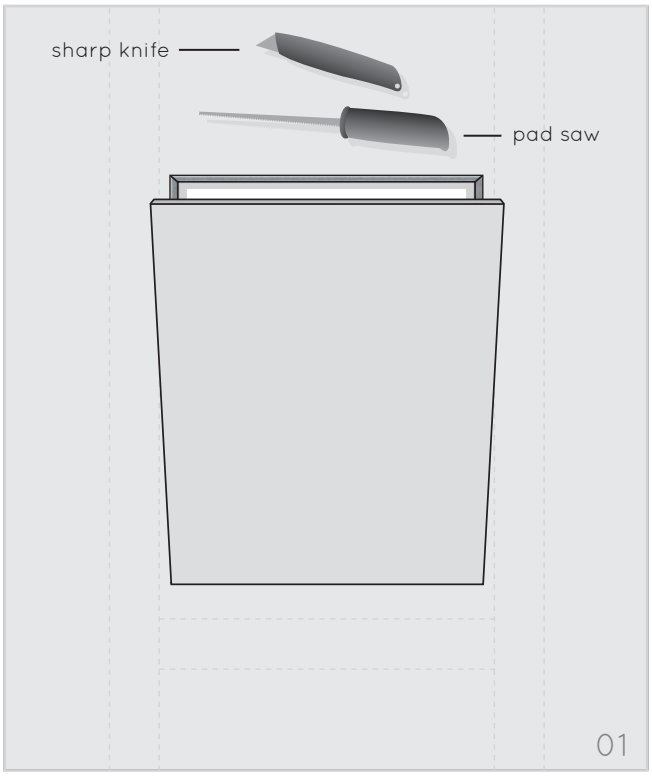
For New Builds or full refurbishment where sound transmission needs to be reduced.

01 Create 455 x 350mm aperture

Choose speaker location by following step 01, page 5. Using a sharp knife or pad saw, cut an aperture with dimensions 455mm x 350mm (18" x 14") in your plasterboard wall or ceiling. Ensure the aperture is created between supporting joists or stud work.

We strongly advise that joists are not cut to make space for the backbox. Any activity of this sort may well influence the structural integrity of your property.

Important: Double check the size of the aperture is 455mm x 350mm (18" x 14") as this is important further on into the installation process.



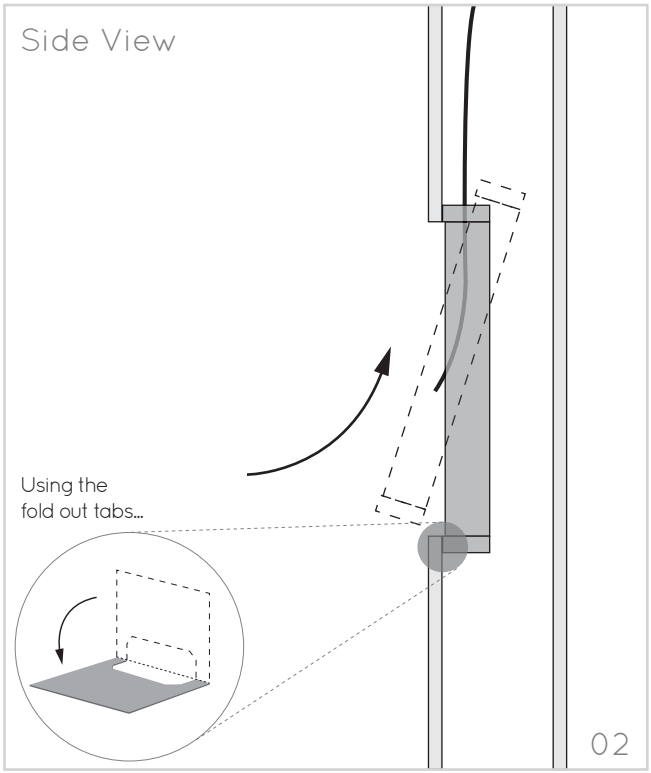
02 Locate cable and position backbox

Pull the speaker cable through the rubber grommet in the top side of the backbox and ensure speaker cables are pulled through with a manageable length available. Doing this will make it easier to connect the cable to the speaker later on in the installation process.

Position the backbox within the aperture so as to rest it against the back side of the plasterboard.

Use the fold out tabs at either end of the backbox to help support it in position before securing it to the plasterboard.

A 75mm/3" cavity depth is required to fit a Backbox FS or Backbox FSS.



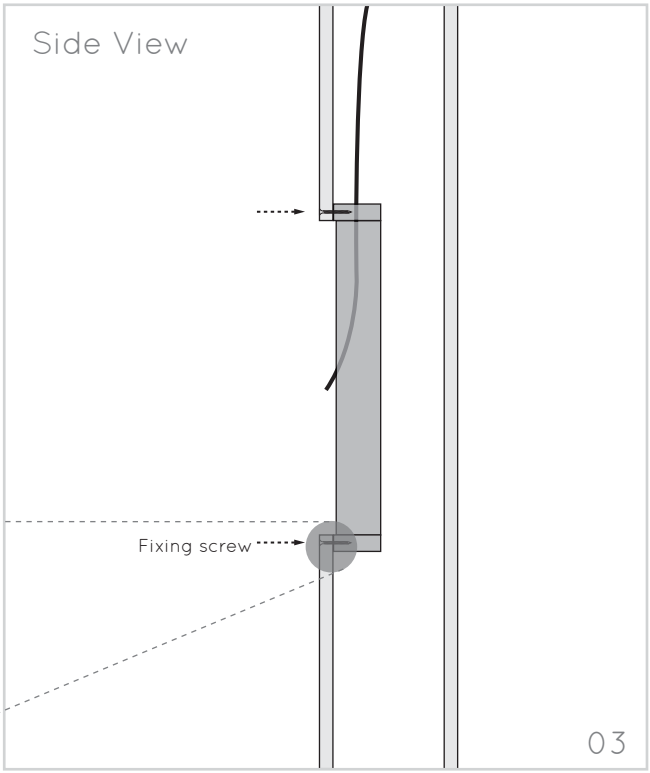
*Reference pages for correct **retrofit** alignment and plastering method: **14 + 15***
*Reference page for correct **new build** alignment and plastering method: **16***
*Reference pages for correct **drywall** alignment and plastering method: **20 + 21***

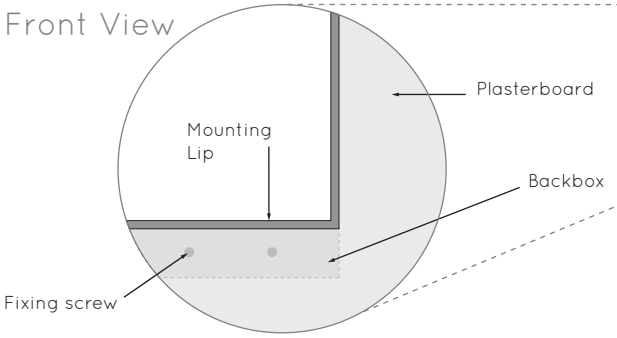
Cavity installation with backbox continued...

A

03 Fix backbox

Using 8 drywall screws (4 at each end) fix the backbox by screwing through the plasterboard and self tapping into the flat areas at each end of the backbox. When positioned correctly, the backbox's speaker mounting lip with soft foam surface should be visible along all four sides of the aperture.

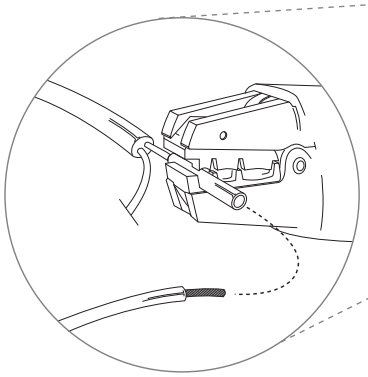


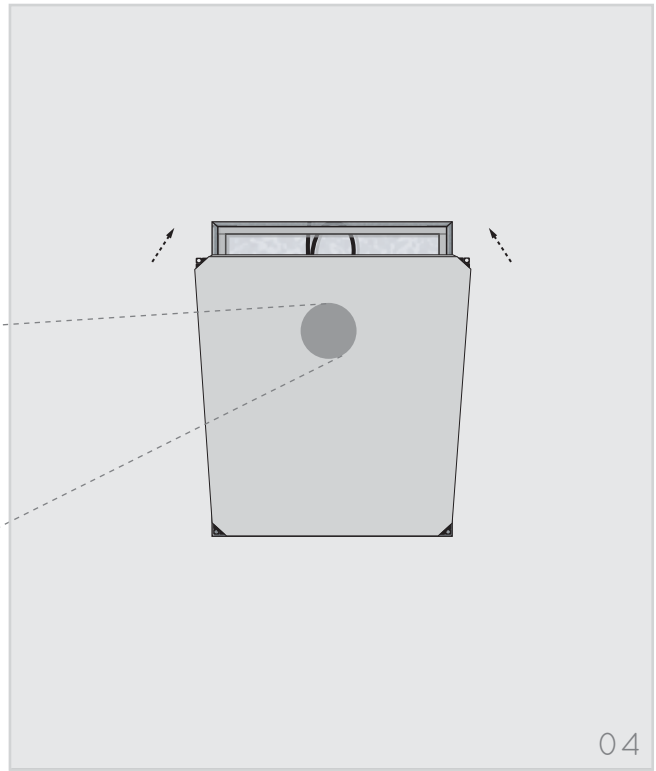


04 Connect the speaker

Connect the speaker cable to the speaker and crimp securely using a high quality crimping tool.

Locate the speaker within the aperture resting it on the soft foam on the backbox mounting lip.





*Reference pages for correct **retrofit** alignment and plastering method: **14 + 15***
*Reference page for correct **new build** alignment and plastering method: **16***
*Reference pages for correct **drywall** alignment and plastering method: **20 + 21***

Cavity installation with backbox continued...

A

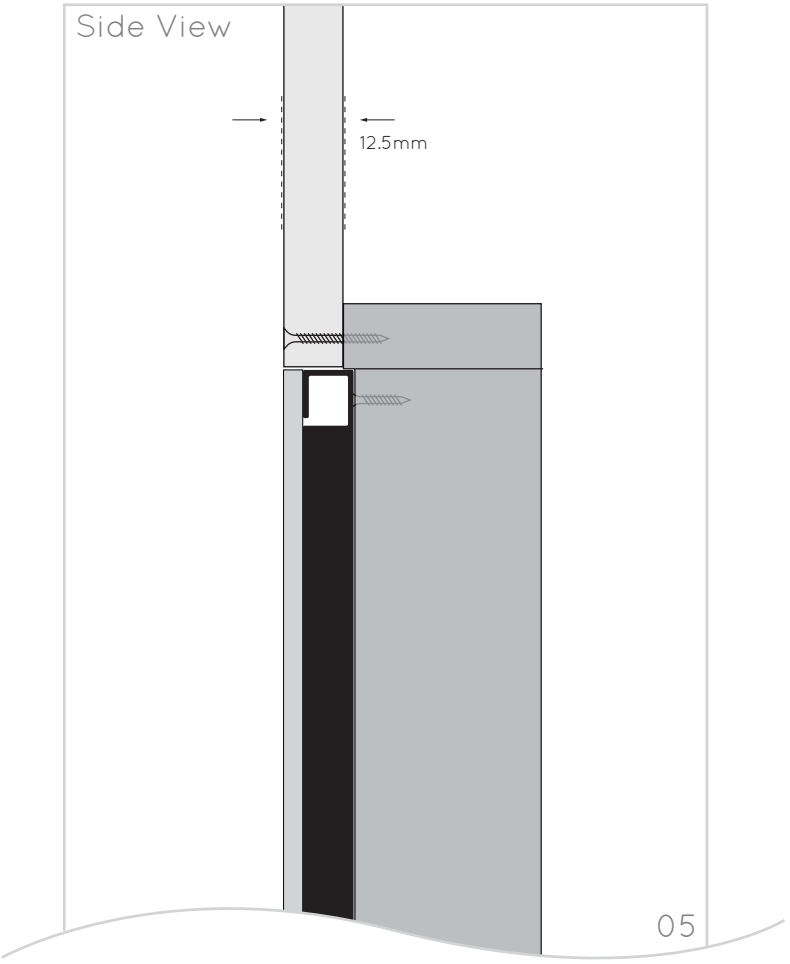
05 Secure the speaker

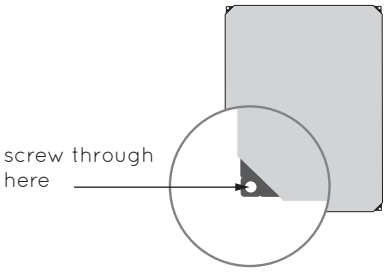
With the speaker resting on the backbox, use drywall screws to secure the speaker onto the backbox by self tapping into the mounting lip, through the pilot hole at each corner.

Ensure the speaker face is flush with the front of the plasterboard wall and that everything is firmly held in position. Shims may be necessary. (See section B)

Amina backboxes (Backbox FS and FSS) are designed for 12.5mm (1/2") plasterboard. Shims can be supplied to adapt the backbox for different plasterboard thicknesses. Contact your supplier when ordering.

Continue on to Section C (page 22 - testing)





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*Reference page for correct **new build** alignment and plastering method: **16***
*Reference pages for correct **drywall** alignment and plastering method: **20 + 21***

Solid wall installation with backbox

A

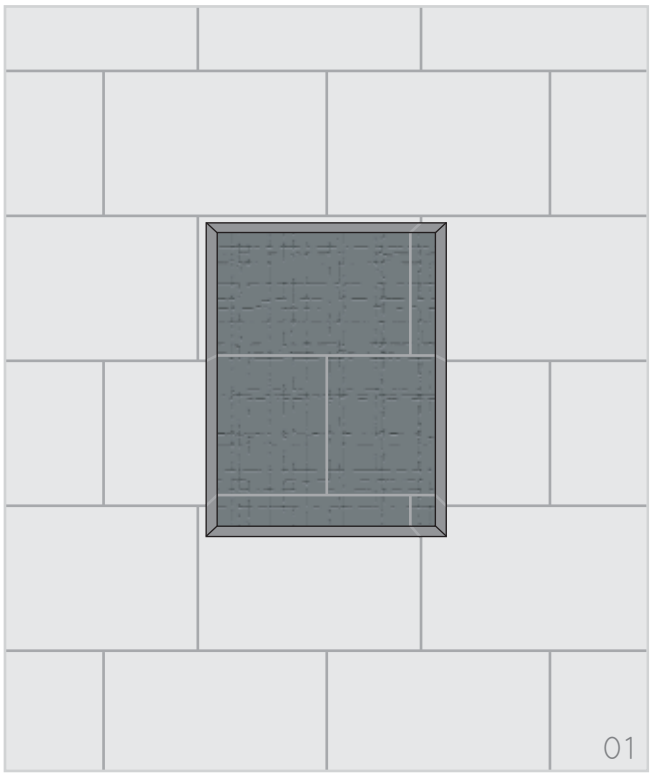
For new builds or full refurbs where the wall or ceiling has not been rendered or plastered.

01 Create aperture in brickwork

Using the combination of an angle grinder and a jackhammer drill, create a cavity of 460mm x 355mm (18 2/16" x 13 31/32") within the brickwork.

Before installing the backbox you will need to know the thickness of render that will be applied to the wall/ceiling prior to the finish plaster skim.

Minus this thickness from 50mm (2") to calculate the minimum cavity depth you will need to create.

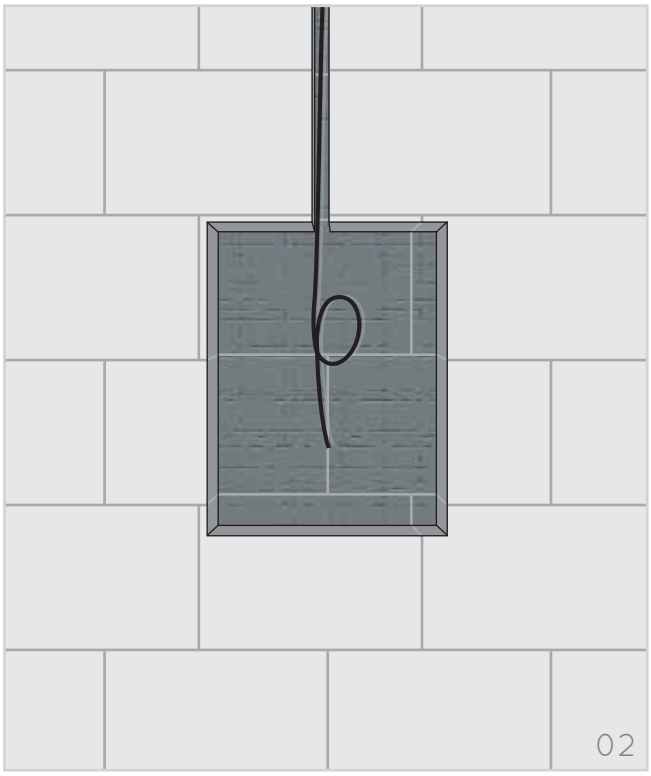


02 Create channel for cable

Using an angle grinder or hammer and chisel, create a channel that runs into the cavity This will allow the speaker cable to be pulled into a suitable position within the cavity.

We recommend the cable is run in a suitable conduit to protect it.

Leave enough cable slack to allow connection to the speaker when it is held away from the cavity.



*Reference page for correct **retrofit** alignment and plastering method: **17 + 18***
*Reference page for correct **new build** alignment and plastering method: **19***

Solid wall installation with backbox continued...

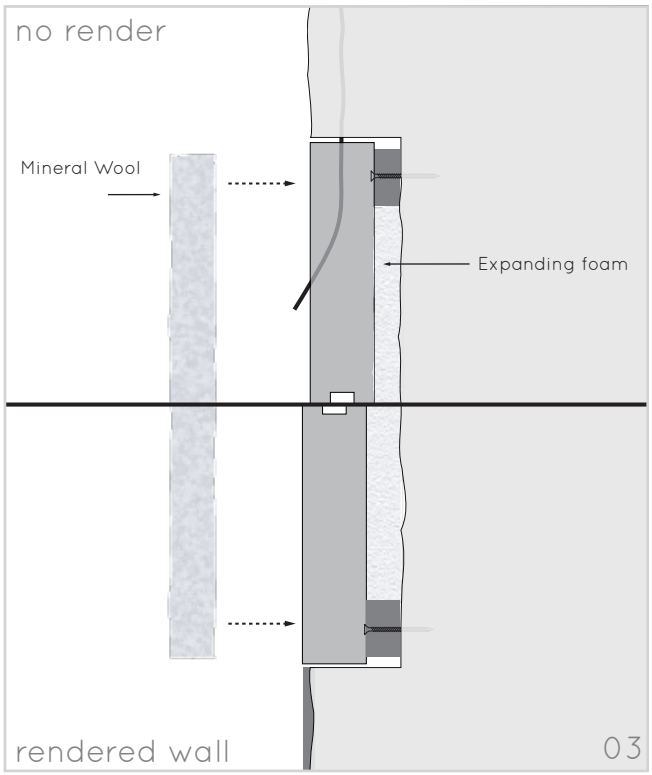
A

03 Install backbox

Make a small hole in one of the rubber grommets and pull the speaker cable through it and into the backbox. There are four slots in the base of the backbox and using suitable screws (not supplied), fix the backbox to the brickwork within the cavity. Ensure the front edge of the backbox aligns flush with the front face of the surface which will be plaster skimmed.

We recommend shims are fitted behind the backbox to achieve a level solid fixing. It is recommended to add sound absorbing mineral wool (1" maximum thickness) to the inside of the backbox and expanding foam around the sides to prevent resonance.

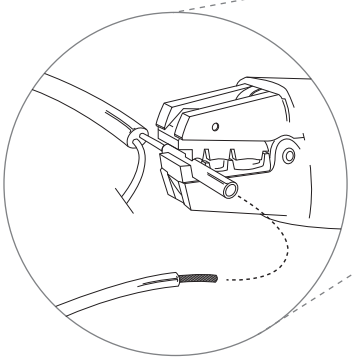
NB: If there is a layer of render to be applied or already applied to the brickwork, be sure to align the front edge of the backbox to the front edge of the render (as shown in the lower section of the image)

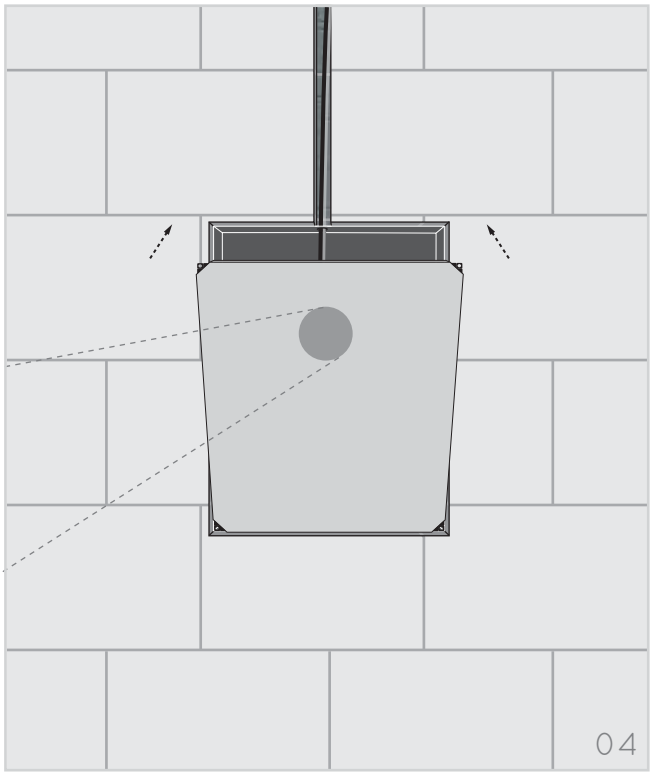


04 Connect speaker

Connect the speaker cable to the speaker and crimp securely using a high quality crimping tool.

Locate the speaker within the aperture and rest it against the 6 mounting tabs on the backbox.





*Reference page for correct **retrofit** alignment and plastering method: **17 + 18***
*Reference page for correct **new build** alignment and plastering method: **19***

Solid wall installation with backbox continued...

A

05 Secure the speaker

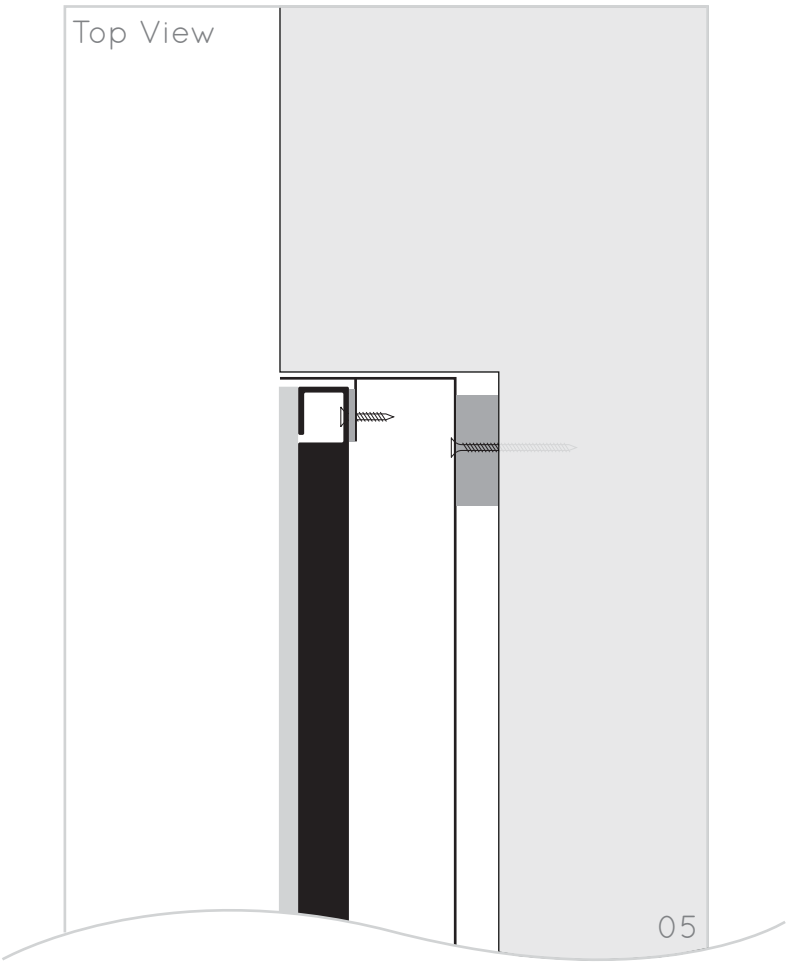
Remove the backing paper from the 6 adhesive pads on the backbox mounting tabs, carefully position the speaker onto the support tabs and apply moderate pressure. There should be an equal perimeter gap between the backbox and the edge of the speaker.

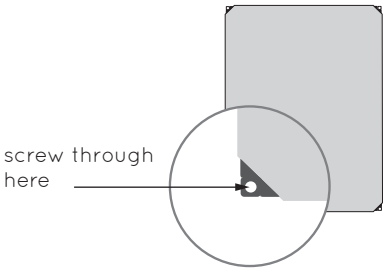
Use the flange head screws (supplied with the backbox) to fix the corners of the speaker to the four corner support tabs.

If the correct steps are taken to align the backbox with the front face of the wall/render, the loudspeaker, when screwed in place, will also sit flush with the front face of the wall/render.

Do not adjust the screws in any way, make sure they are tightly screwed in place and the whole assembly is firm.

Continue on to Section C (page 22 - testing)





*Reference page for correct **retrofit** alignment and plastering method: **17 + 18***
*Reference page for correct **new build** alignment and plastering method: **19***

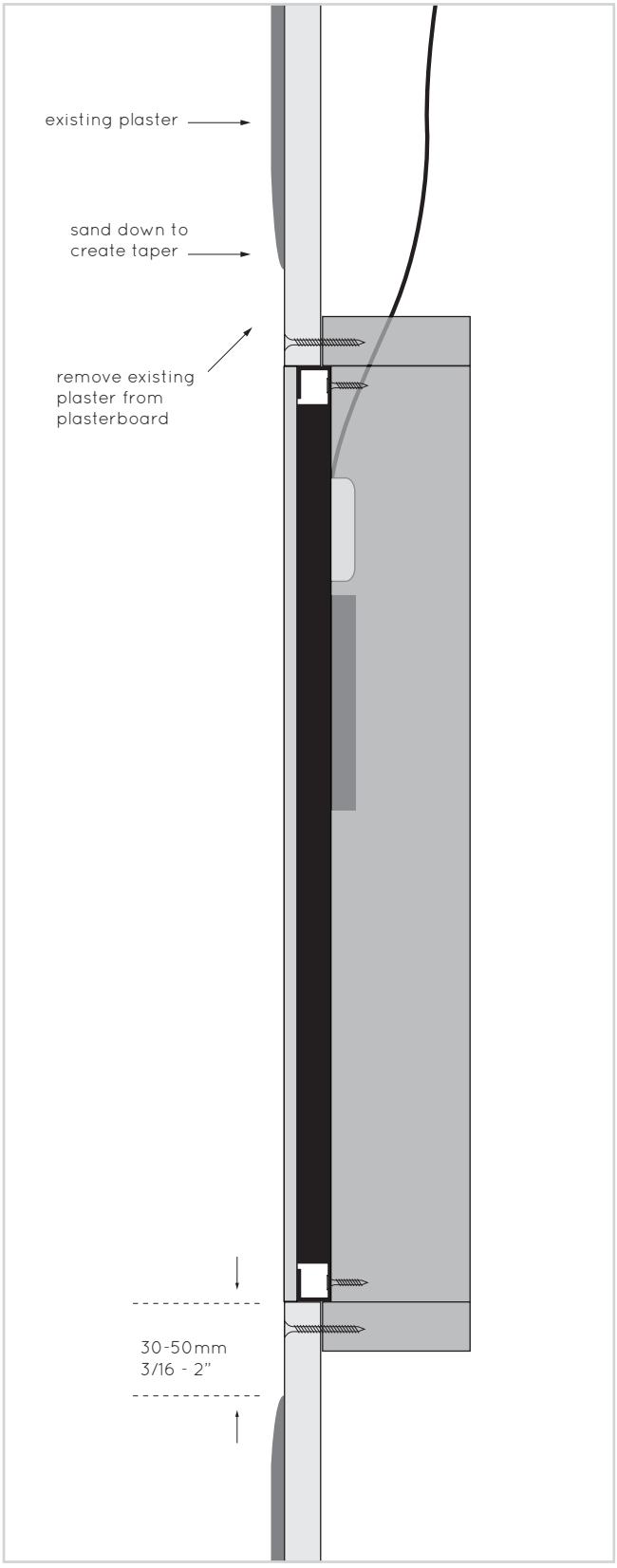
Retrofit / pre-skimmed plasterboard
Patch plastered finish

B

For walls / ceilings that have already been plastered.

Speaker alignment required for plastering

After removing a 30-50mm (3/16 - 2") wide section of existing plaster surrounding the cutout, the front face of the speaker should be flush with the paper face of the plasterboard.



This is the method that will be used during plastering (Section D). It positions the speaker to be patch plastered with a 2mm (5/64") skim across the speaker front, blended with the existing plaster on the plasterboard. Amina recommend British Gypsum Easi-fill® which allows a smooth accurate finish using fine sandpaper or a wet sponge.

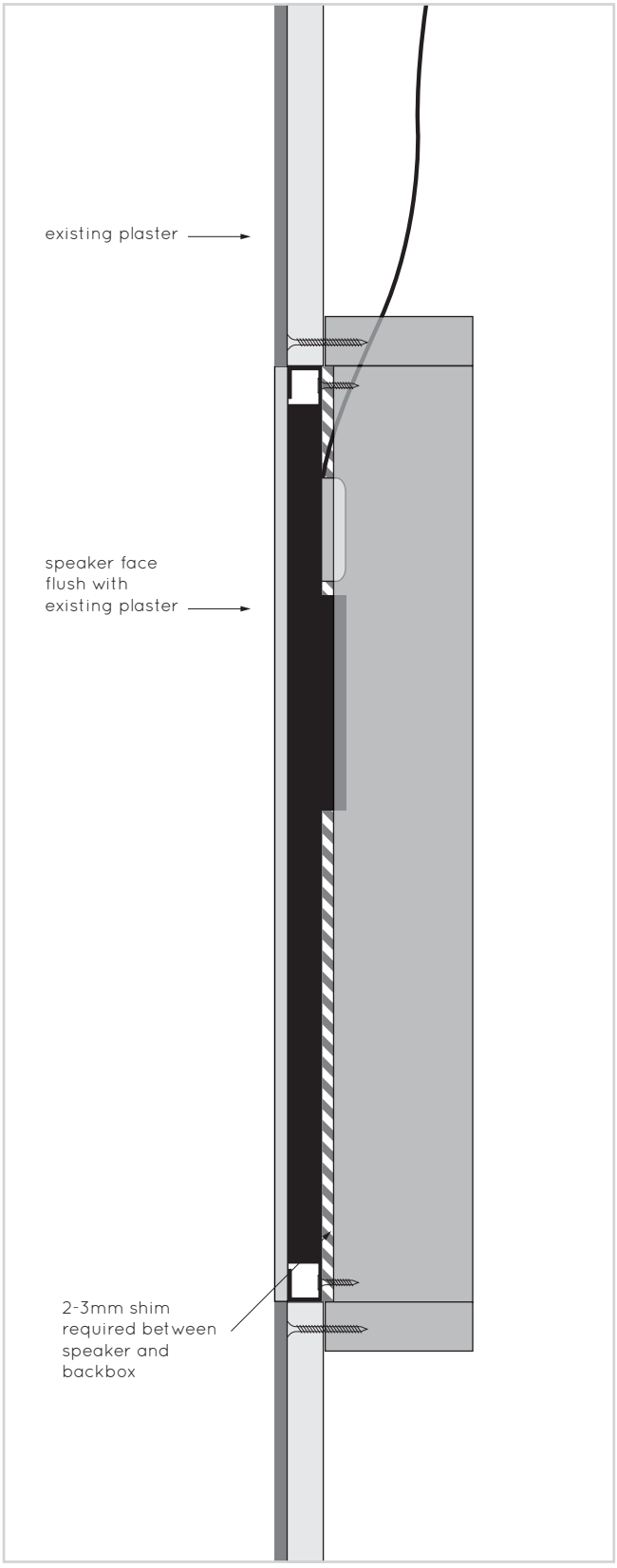
Retrofit / pre-skimmed plasterboard
Feathered skim finish

B

For walls / ceilings that have already been plastered.

Speaker alignment required for plastering

Using a 2-3mm shim set (contact your Amina supplier) between the back of the speaker and the mounting surface of the backbox (or fixing blocks), the front face of the speaker should be flush with the front face of the existing painted/plastered wall/ceiling.



This is the method that will be used during plastering (Section D). The method positions the speaker allowing a much larger area around it (approx. 1m^2 (39")) to be skimmed. This 1-2mm (5/64") thick skim is then feathered outward at the edges and blended into the existing wall/ceiling finish.

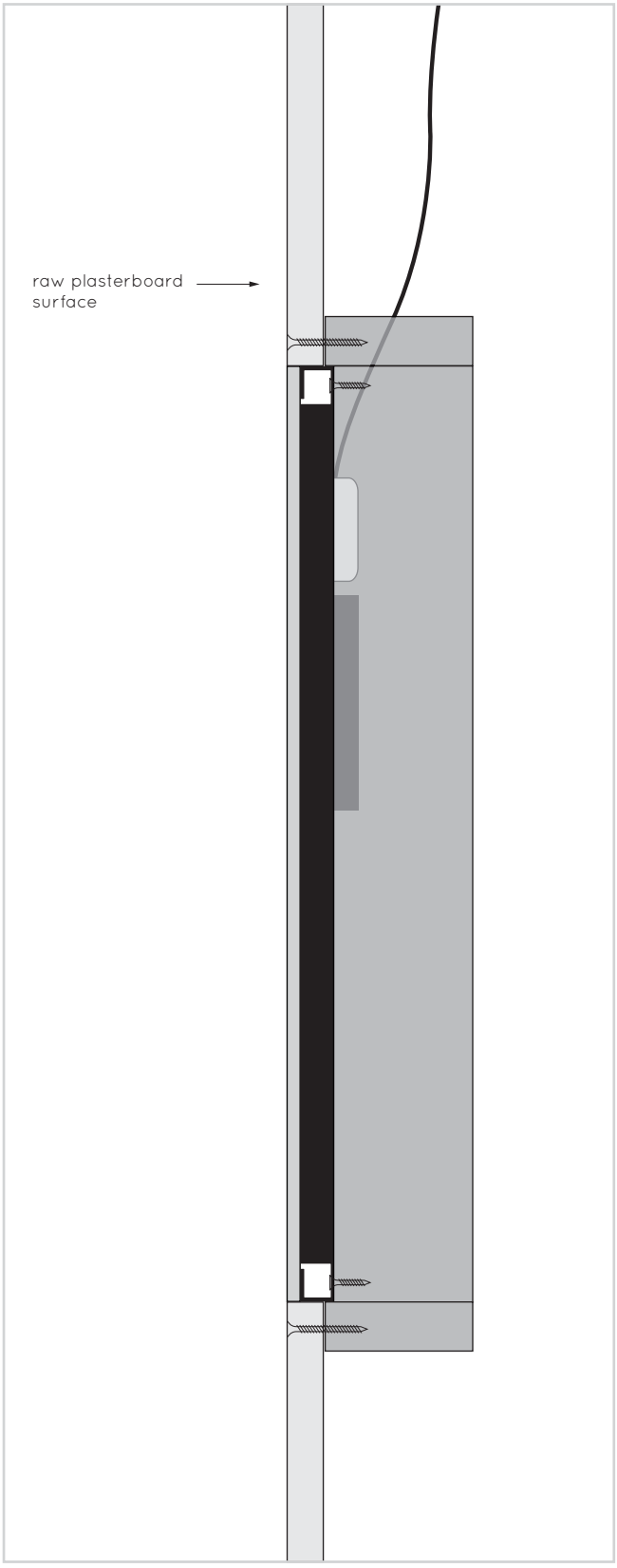
New build / new plasterboard
Full wet skim finish

B

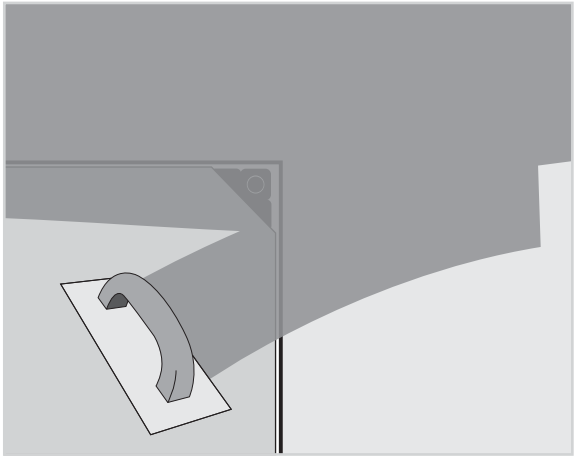
For new plasterboard walls / ceilings that have not yet been plastered.

Speaker alignment required for plastering

The front face of the speaker should be flush with the face of the new wall/ceiling if correctly installed.



This is the method that will be used during plastering (Section D). The speaker will be skim plastered over during the process of the entire wall/ceiling being plastered.



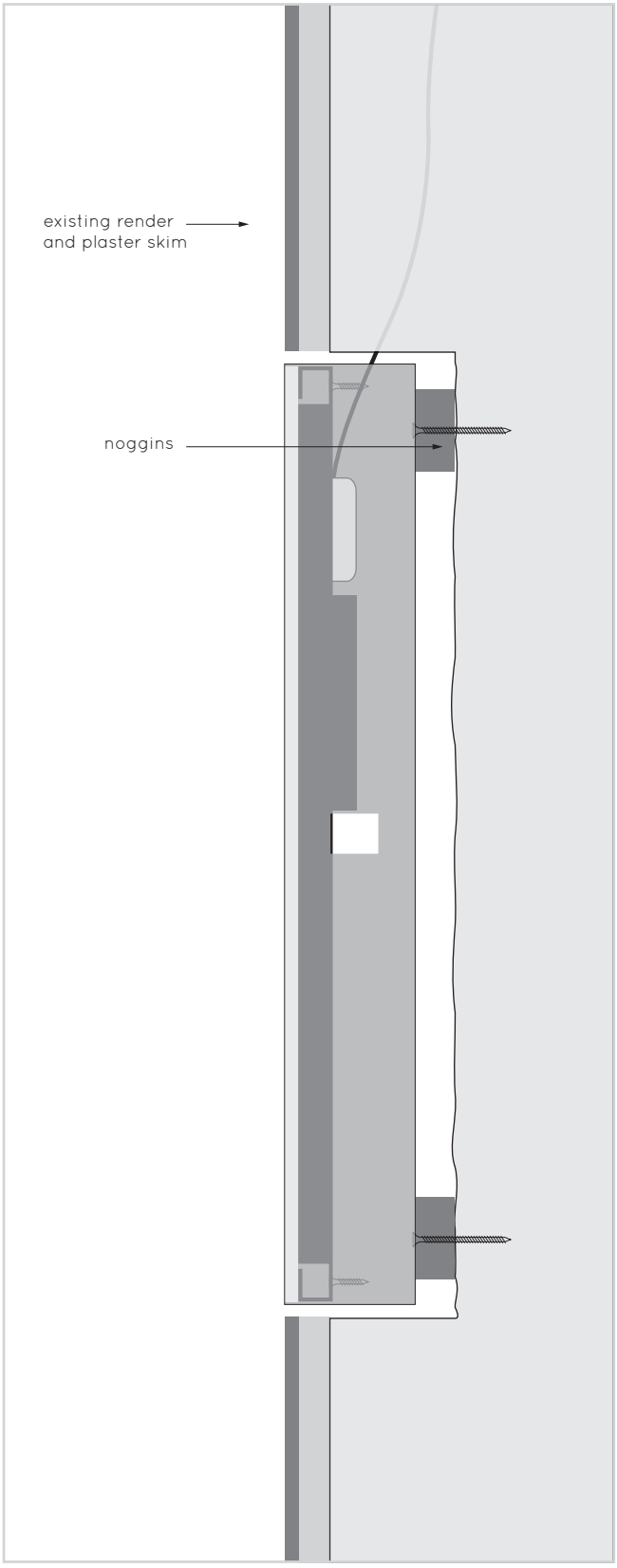
Retrofit / pre-skimmed solid wall
Feathered skim finish

B

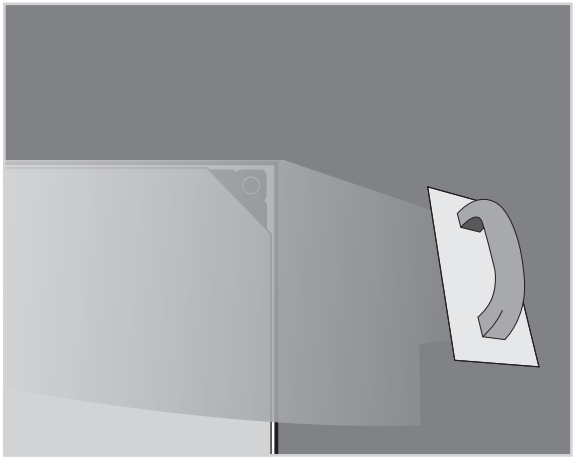
For solid walls / ceilings that have already been plastered and painted.

Speaker alignment required for plastering

Use noggins between the back of the backbox and the inside of the cavity to align the front edge of the backbox with the front face of the finished wall.



This is the method that will be used during plastering (Section D). The method positions the speaker for a large area (approx. 1m^2 (39")) to be skimmed over it. This 2mm (5/64") thick skim is then feathered outward at the edges and blended into the existing wall/ceiling finish.



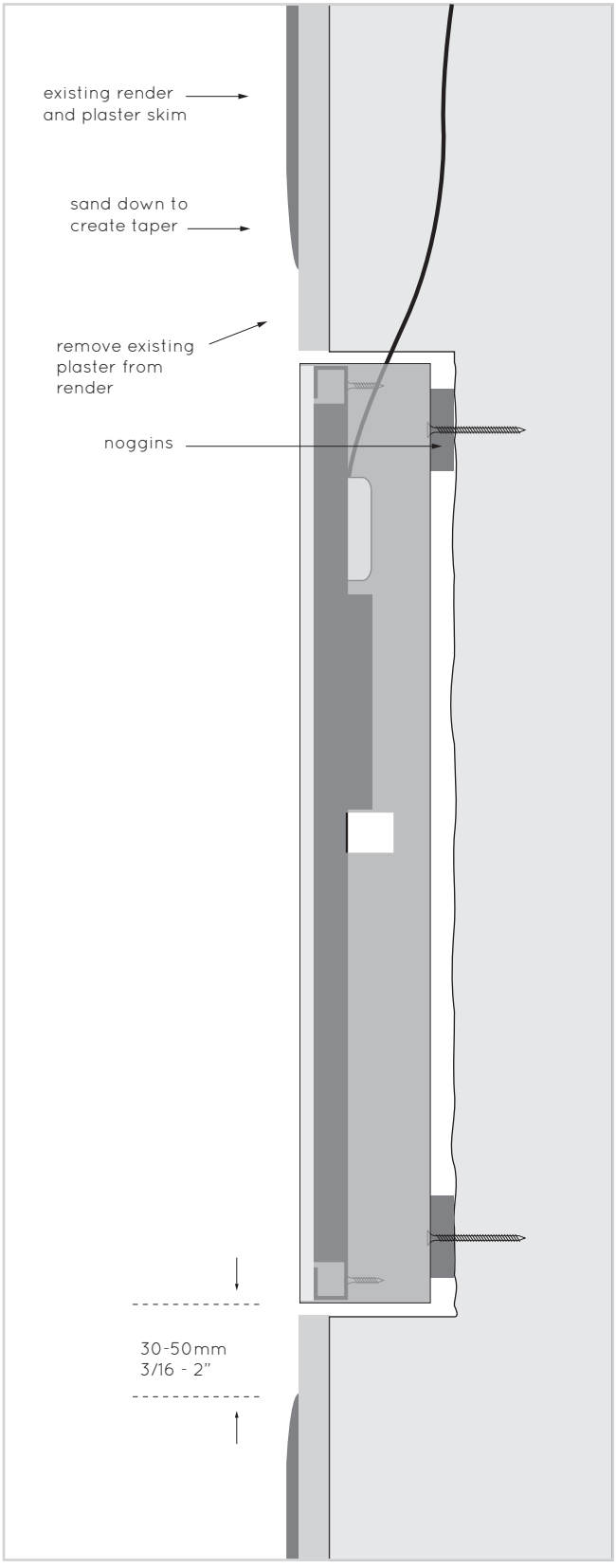
Retrofit / pre-skimmed solid wall
Patch plaster finish

B

For solid walls / ceilings that have already been plastered and painted.

Speaker alignment required for plastering

Use noggins between the back of the backbox and the inside of the cavity to align the front edge of the backbox with the front face of the base render. This should be no more than 2mm (5/64") behind the finished plaster surface.



This is the method that will be used during plastering (Section D). It positions the speaker to be patch plastered with a 2mm (5/64") skim across the speaker front and blended with the existing plaster.
Amina recommend British Gypsum Easi-fill® which allows a smooth accurate finish using fine sandpaper or a wet sponge.

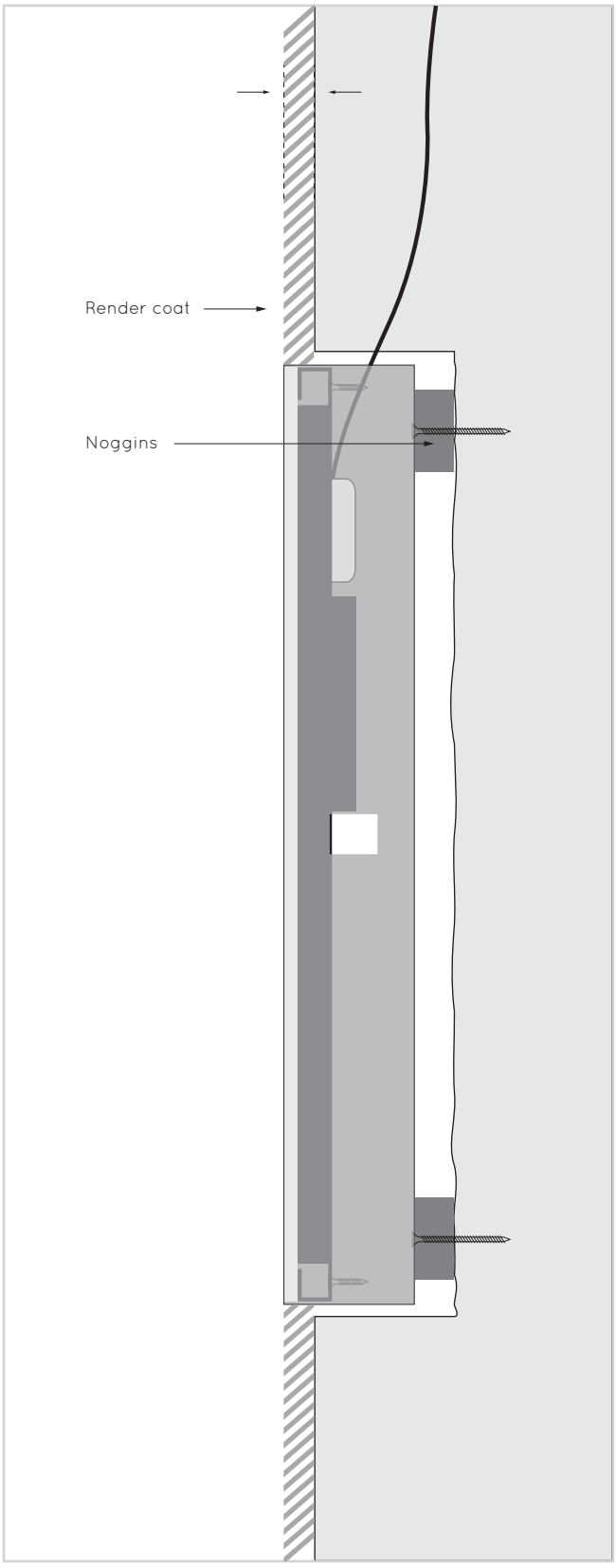
New Build / new solid wall
Full wet skim finish

B

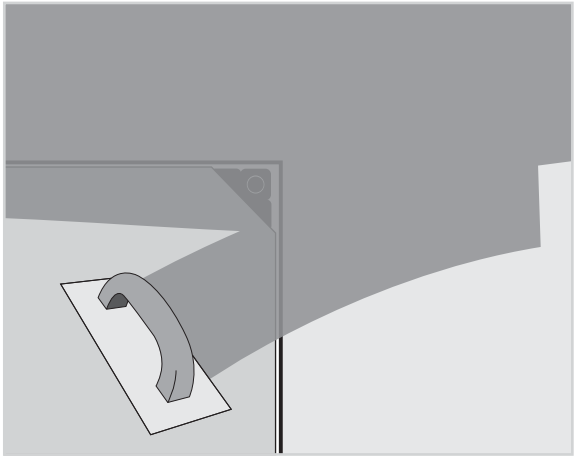
For solid walls / ceilings that have already been rendered but not yet plaster skimmed.

Speaker alignment required for plastering

Use noggins between the back of the backbox and the inside of the cavity to align the front edge of the backbox with face of the rendered wall.



This is the method that will be used during plastering (Section D). The speaker will be skim plastered over during the process of the entire wall/ceiling being plastered.



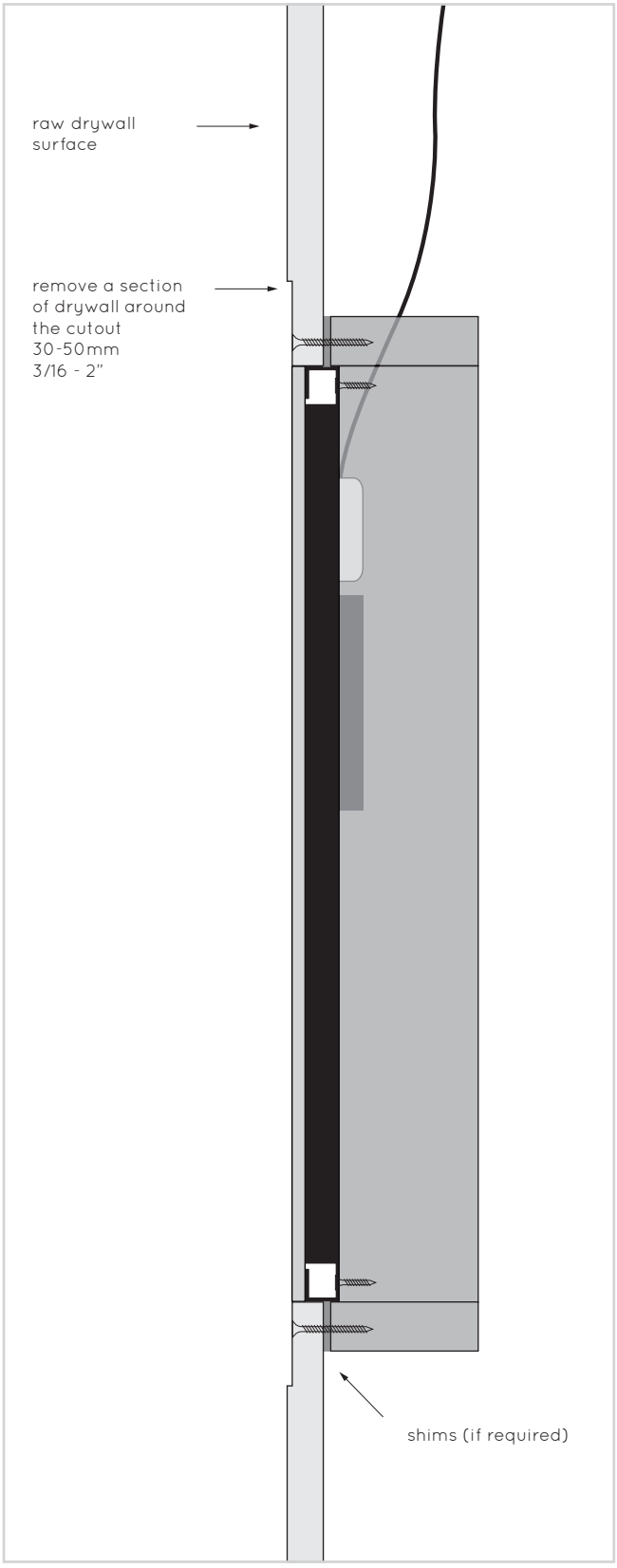
Retrofit / new drywall
Patch plaster finish

B

For new drywall walls / ceilings that will be taped and joined.
(North American construction)

Speaker alignment required for plastering

The front face of the speaker should be located 2mm (5/64") behind the face of the new wall/ceiling if correctly installed.



This is the method that will be used during plastering (Section D). It positions the speaker to be patch plastered with a 2mm (5/64") skim across the speaker front and blended with the drywall.
Amina recommend British Gypsum Easi-fill® which allows a smooth accurate finish using fine sandpaper or a wet sponge.

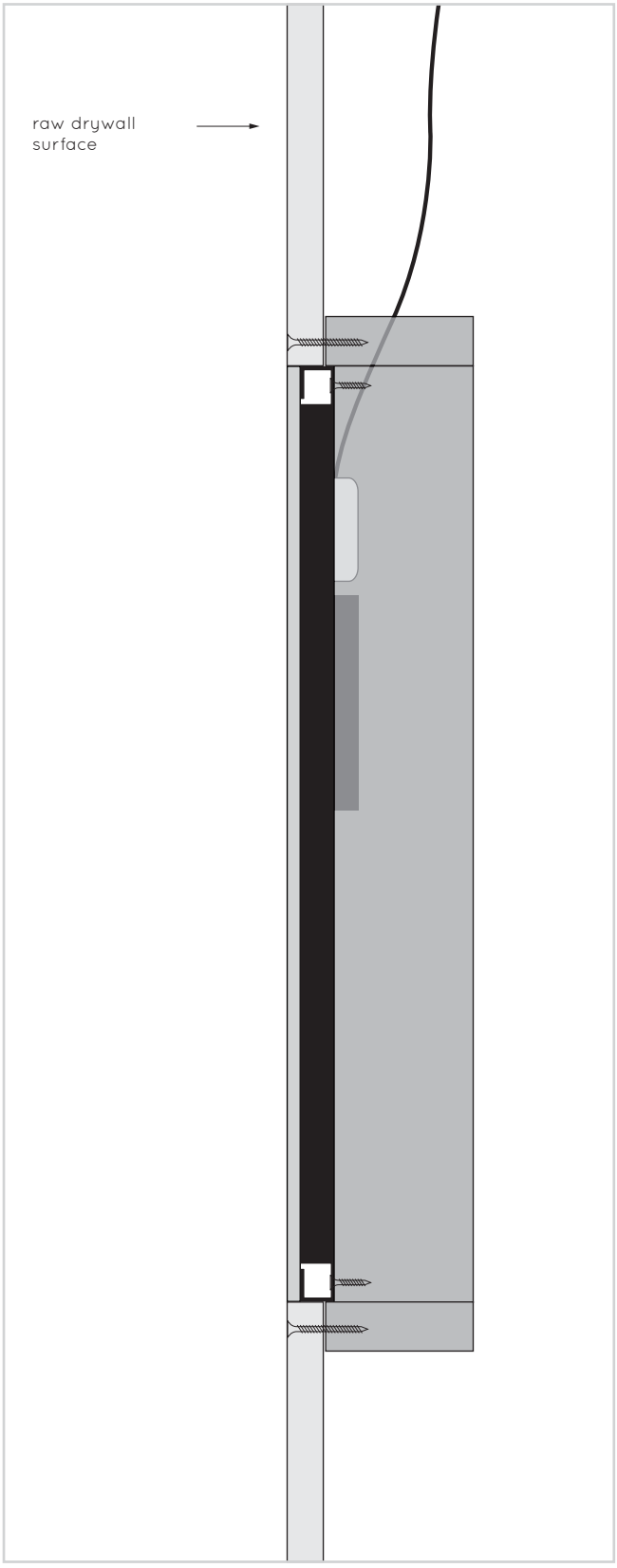
Retrofit / new drywall
Feathered skim finish

B

For new drywall walls / ceilings that will be taped and joined.
(North American construction)

Speaker alignment required for plastering

The front face of the speaker should be flush with the face of the new wall/ceiling if correctly installed.



This is the method that will be used during plastering (Section D). The method positions the speaker for a large area (approx. 1m^2 (39")) to be skimmed over it. This 2mm (5/64") thick skim is then feathered outward at the edges and blended into the existing wall/ceiling finish.

Testing the speakers

Important: Always test the speaker before plastering over it

- Amina recommends a tone sweep be used at a moderate volume level (2.83 Vrms). Such a test will quickly highlight any buzzes or rattles that could be caused by loose screws, cables touching the speaker or the wall itself.
- If the plasterboard is not securely fastened to the joists this could also create a buzz or a rattle. Apply more screws if necessary - particularly around the speaker location.
- Ensure that the speaker cable is not touching any part of the speaker (or backbox) as this can lead to buzzes and rattles. To avoid this it is advised to lay the cable against the mineral wool or other wadding.
- If metal studs are used, ensure the crossover point of the studs are secured together. This can be achieved by applying drywall screws through the wall surface and through the metal joists. If they are not secure this may well lead to audible vibrations and rattles.
- Check cable continuity back to the amplifier by using a multimeter to check the impedance. After connection to the speaker, the impedance should be 8 Ohms or a little more depending on cable length. If it measures significantly different, check for breaks or shorts in the cable.
- Play music to check for buzzes and rattles during transient peaks. Do not judge the speaker's sound quality at this stage. Once plastered over it will sound as intended.
- Always connect the APU2 when testing.

CAUTION:

Without plaster on the surface of the speaker it is highly efficient and will generate very high sound pressure levels with minimal power input. Take care to protect your ears when testing at this stage.

Continue on to Section D (page 23 - plastering & decorating)

Plastering and decorating

D

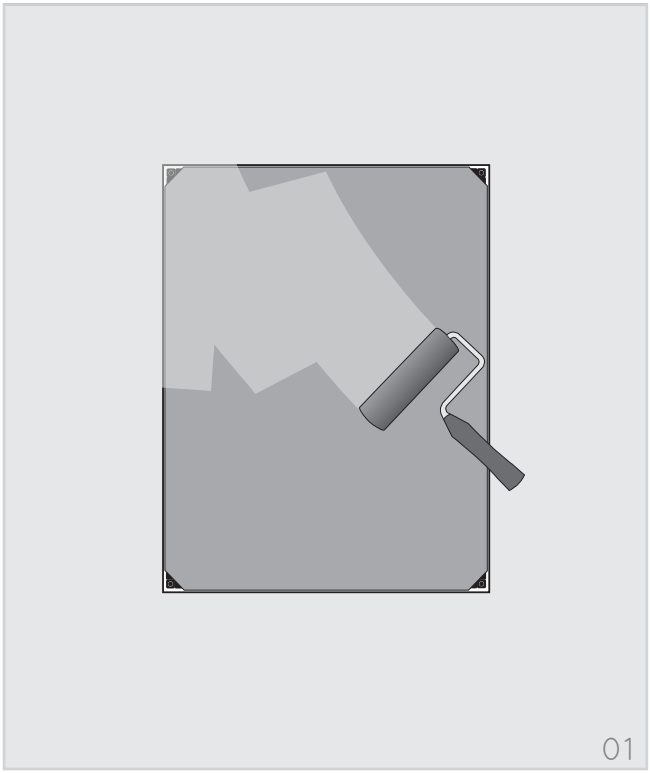
01 Apply PVA

Using a brush or foam roller, apply a thin coat of PVA (wood glue) to the entire speaker panel surface, this will assure proper adhesion between the panel surface and the plaster coating.

Use 1 part PVA to 2 parts water.

PVA primer is fast drying and can usually be ready to plaster after one hour or in accordance with the manufacturers instructions. Ensure PVA primer is completely dry before proceeding.

Important: Amina recommends you leave the PVA to dry for at least several hours, this will ensure the panel surface and surrounding areas are totally dry, sealed and ready for plastering.


01

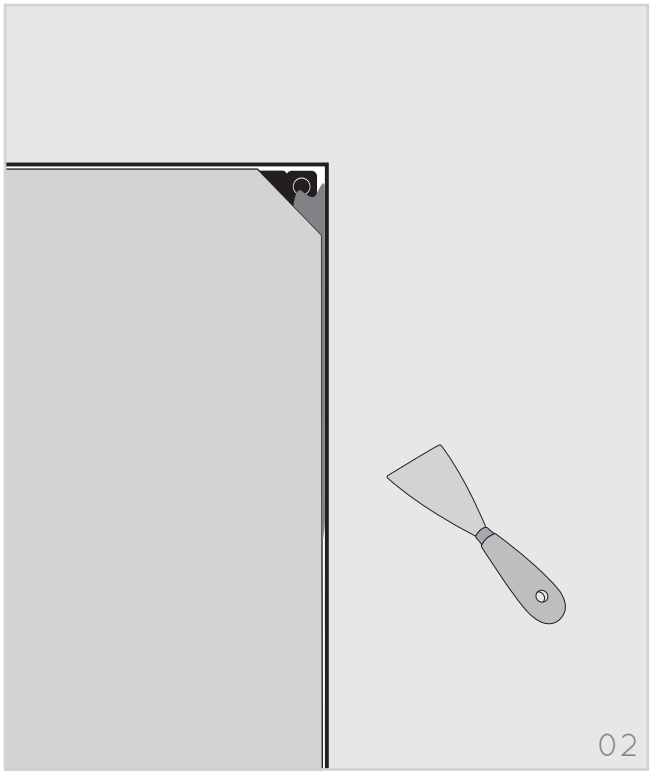
02 Fill gap between speaker and surrounding area

It is important to ensure that plaster is pushed into the 2mm (5/64") gap that surrounds the speaker. This will create a strong bond between the edge of the speaker and the wall.

This further helps to prevent any cracks appearing in the skim finish.

IMPORTANT: There MUST be a gap of 2mm (5/64") all the way around the speaker edge. If there isn't simply remove the speaker and increase the aperture size accordingly (plasterboard installations only)

If you are using a solid wall backbox, ensure there is an even gap between the speaker and the inside edge of the backbox.

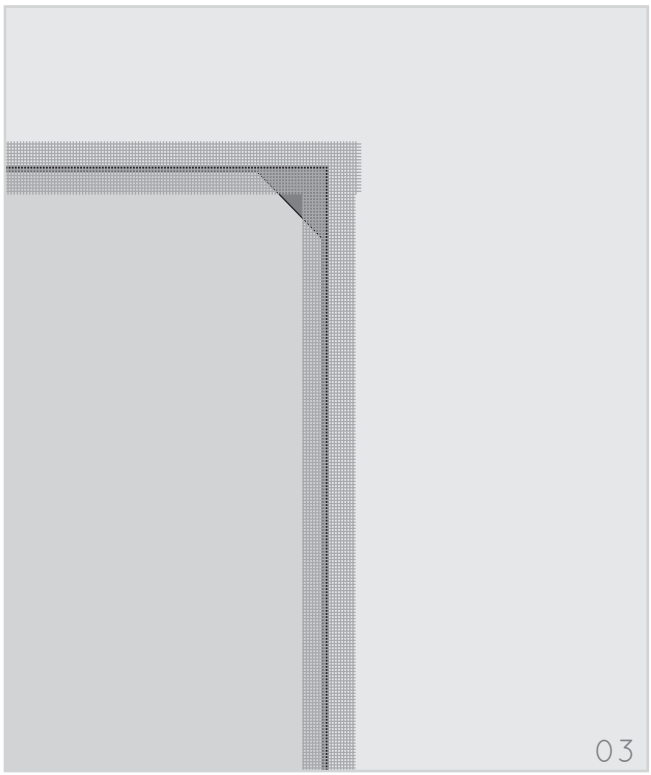

02

Plastering and decorating continued...

D

03 Apply joint tape

Apply professional plasterboard joint tape over the joint between the speaker and the surrounding wall.



04 Plastering

Use standard finishing plaster for large areas. For patch plastering use a repair plaster such as British Gypsum Easi-fill®

Please refer to the appropriate page in Section B (alignment and plastering preparation for your specific installation type). Pages 14 - 21

Important: To ensure proper operation and sonic performance, no more than 2mm (5/64") of plaster must be applied to the surface of the panel.

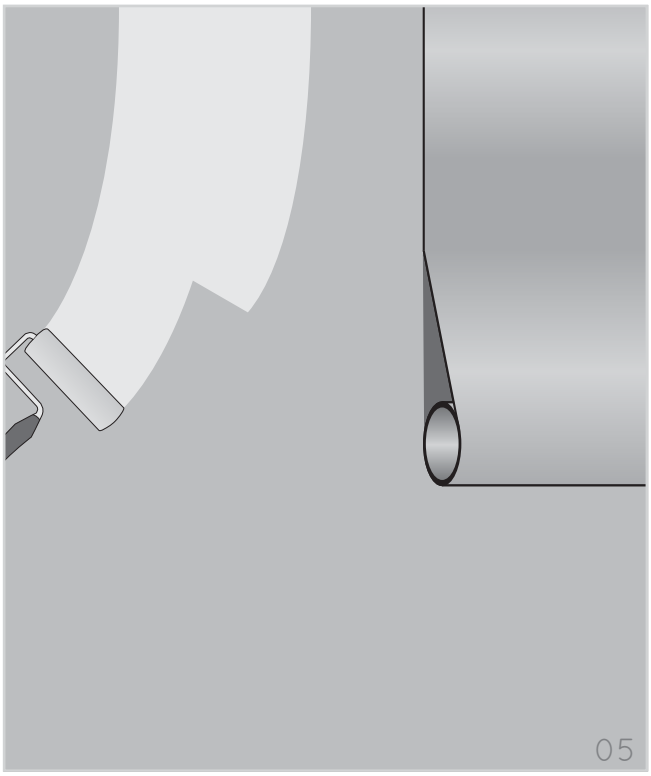
05 Decorating

Allow your plasterwork to dry completely. Test the speaker again (see Section C, page 22). You can then paint the surface or hang wallpaper in the usual manner.

AIW350E Series speakers have been optimised for 3 coats of emulsion once plastered. Additional coats will cause very small reductions in the maximum sound pressure levels achievable.

Note:
Amina have separate guides for information about installing the product behind other materials and surfaces such as wooden panels, acrylic and melamine (Formica®).

Contact Amina if you require any of this additional information (page 32)



Setup tips

APU2 / APU-RS8

- Your AIW350E speaker must be used with the supplied APU protection device. AIW350En models should be used with an APU2 or APU-RS8 or Amina approved active device in commercial systems. Please refer to the detailed instructions supplied with the APU2 and APU-RS8 for connection advice.

Installation Backboxes

- The AIW350E has been designed to sound at its best when used in the Amina BackboxFS. We recommend that they are used wherever possible in your installation. If our basic fixing block kit is used you may find that the low/mid frequencies are reproduced less accurately, but any effect will be very much installation specific.

- When installed into solid walls or ceiling using the Amina BackboxSW, you may find that the AIW350E reproduces slightly less low frequency output compared to a BackboxFS installation. Also, depending on the building construction there may be significant mechanical sound transmission into adjacent rooms/properties.

AIW350E Audio Characteristics

- The AIW350E speaker generates sound in a similar way to an acoustic musical instrument. The speaker's front face is effectively the "musical" soundboard and the sound waves generated from it are diffuse and are dispersed over a very wide angle. This means that loudspeaker positioning is far less critical than with conventional speakers. Additionally, just like the acoustic musical instrument, the AIW350E has excellent room filling abilities.

- The AIW350E is a planar device and this feature is further enhanced when it is flush mounted into your wall or ceiling. Being planar (or flat) means that the audio's arrival time to the listener is the same for all frequencies, i.e. there is very little phase distortion. Therefore the AIW350E (and other planar devices such as electrostatic loudspeakers) can reproduce subtle nuances on a recording with incredible accuracy.

- In addition to the above characteristics, the radiating surface of the AIW350E is very stiff and undergoes very small amounts of movement in order to generate high sound pressure levels. This means that the AIW350E is inherently "fast" making it a highly articulate loudspeaker.

Wall or Ceiling Placement

- The AIW350E is suitable for both wall and ceiling installations. When the most uniform audio coverage in a room is required, space the speakers evenly in the ceiling. However if the room has a height greater than 6m (19') Amina suggests installing them in the walls at a height of around 1.8m (6').

- In dedicated listening rooms where AIW350E speakers are used in stereo or multi channel systems, position them in the walls so that the centre point of the AIW350E is approximately 1 – 1.8m (3.5 - 6') from the floor. This will give excellent results, but don't worry if this is not possible to achieve in your room as the audio characteristics of the AIW350E make exact positioning according to stereo/5.1/7.1 conventions far less critical.

Setup tips

Speaker Orientation

- The AIW350E can be installed either in portrait or landscape orientations. Typically the spacing between wall joists will dictate the portrait orientation and we have optimised the dispersion characteristics for this setup. Therefore when installing into walls we suggest the portrait orientation for best sound quality.

- For non-critical listening in ceiling installations the orientation of the speaker is not crucial, but we do recommend positioning the top of the speaker closest to the walls of the room and to mirror this with the alignment of any speakers that are on the other side of the room.

- For critical listening in ceilings, e.g. a 5.1 surround system, ensure that the orientation of all speakers is the same relative to the main listening position and position the top of the speaker closer to the walls.

System Requirements

- From a system compatibility point of view your AIW350E [and its accompanying APU protection unit] can be treated like any conventional 6 - 8 Ohm loudspeaker. Amina recommend you use a good quality amplifier so as to avoid driving them with high levels of distortion which at best will provide poor sound quality and at worse may permanently damage the loudspeaker. Amina also recommend you connect the AIW350E to your amplifier with at least 16AWG OFC (oxygen free) cable (14AWG for long runs) to avoid any chance of reduced efficiency and audio bandwidth.

- For 2.1, 5.1 and 7.1 systems always use the amplifier's crossover settings to divert frequencies below 100Hz to your subwoofer. This will improve the dynamic range and power handling of the system. (APU2 and APU-RS8 should still be used).

- IMPORTANT: AIW350E speakers are highly revealing of any shortcomings in the source or amplifier. Please be aware that some low powered (and some higher powered) zone amplifiers will produce high amounts of distortion well within their operating range and this will be ruthlessly revealed by a speaker such as the AIW350E.

Sound Transmission

- As with any speaker designed to be fixed to a structure within a wall or ceiling, careful consideration should be given to sound transmission into adjacent rooms or properties. We recommend specialist advice is taken if sound transmission into adjacent rooms needs to be minimised. See the Amina Specifier's guide for information on reducing sound transmission as a starting point.

100/70V Option

- For multi-speaker commercial installations, AIW350En loudspeakers can be supplied with 100V or 70V line transformers fitted. In these systems an active high-pass filter must be installed - 24dB/octave at 120Hz minimum attenuation. Power ratings of 5W, 10W or 20W are available.

Further details

Maintenance and cleaning
Once your AIW350E speaker is plastered into your wall or ceiling, it requires no physical maintenance. Your wall or ceiling can be cleaned with products appropriate to the finish finally applied to the plaster surface.

The wall or ceiling can be painted or redecorated any number of times (see proviso, page 24, step 5). Extreme care should be taken when removing wallpaper type coverings to ensure the plaster surface is not damaged. If damage to the plaster work occurs, use repair plaster to restore the plaster surface prior to re-decorating. Amina Technologies Ltd recommends British Gypsum Easi-fill® repair plaster. Avoid pushing the wall or ceiling surface immediately in front of the speaker. Excessive excursion, whilst unlikely to damage the speaker, will undoubtedly cause the plaster to crack around its perimeter.

Reliability
Correctly installed and used within its specification, the Amina AIW350E series speaker is designed to give many years of trouble-free service. The vibrational soundboard technique used by the AIW350E has very few moving parts. Compared to a conventional moving coil speaker these movements are insignificant. Whilst the human touch can feel the tiny movements, they cannot be seen by the naked eye. Such small movement of this electromechanical structure means the long term reliability is enhanced compared to much larger movements of conventional loudspeakers.

Removal
In the unlikely event of a problem developing with the product, or you simply wish to remove the item to change its location, please refer to the following guidelines:

Locate the speaker by tapping the wall or ceiling listening for a hollow sound compared to the rest of the wall/ceiling. Then, with a sharp chisel or decorator's scraper, carefully chip into the plaster to expose a small area of the panel surface. To ensure you do not damage the panel, hold the tool at an acute angle to the wall or ceiling.
Now, holding the scraper almost parallel to the panel surface, work outwards towards the product's edge easing the plaster away from the panel. Do not worry if the panel surface receives marks or indented scratches during this process (it should not, however, have holes entering through to the unique honeycomb panel). Once the product is plastered back into its original or new location, the new skim of plaster will cover all these imperfections and the speakers performance will not be unduly affected.

Clear the surface plaster material from the surrounding plasterboard to expose all the joint tape and subsequently remove it. Use a narrow chisel or flat blade screwdriver to remove the plaster and expose the screws at each corner of the product. Using a suitable screwdriver, remove the four screws and then ease the product from the wall or ceiling and disconnect the speaker cable. Leave all four fixing blocks in place as these can be used to support a small section of plasterboard when making good the wall/ceiling.

If the product needs repairing, please return it to your supplier or Amina Technologies Ltd. Once repaired, the product can be refixed into position following appropriate installation steps detailed earlier within the manual.

Troubleshooting

Thorough testing of the speakers should be carried out both prior to and after plastering to avoid time consuming repairs or modifications at a later stage. Should you encounter any problems at either of the test stages the following guide is designed to help determine possible problem areas.

Advice for testing:
> When testing always use a basic sound system (amp, source, speakers) to eliminate the possibility of faults with other, more sophisticated components, such as control sytems.
> Test at low and medium volumes and be careful not to exceed the specific speaker model's recommended power. Using tone sweeps or music as test material, listen for distortion, buzzing or rattles at appropriate levels. Using test discs or music, confirm that all channels are in-phase.

No or low sound output:
> Check continuity of all cables.
> Check that all cables and connections are made correctly, are intact and that all channels are correctly phased (+ to + and - to - from amp to speaker).
> Using an impedance meter, check the nominal impedance of the speaker (APU2/APU-RS8 must not be connected) both at the terminals and the amp end of the cable. Do these measurements match each other? (Allowing for the small impedance increase of less than 1 ohm along the wire length) do they match the stated nominal impedance on the speakers specification label? If the nominal impedance does not match the product's stated impedance, a speaker driver may be open circuited or short circuited. If so, the product may need to be returned to Amina for repair or replacement.
If the nominal impedance at the end of the cable is very different to the impedance at the speaker, check your cables. Cuts or nicks in the cable along its length can dramatically increase impedance or create a short circuit, dramatically lowering the impedance.

Distortion, buzzing or rattles at modest volumes:
> Try to identify the location of the buzz or rattle. It may be caused by a loose screw or other mechanical object. Check the assembly and ensure screws and fixings are tight.
> If the rattle persists, remove the speaker from the wall and check your wiring to the product. Ensure that wires, with the speaker in the final location, are not resting against the speaker or backbox (if used), causing vibrations.
> With no audio signal applied, lightly push the speaker face in and out at its center. Listen carefully for rubbing on the driver, which may sound like scratching. This may indicate the speaker has been over driven and subsequently damaged. The speaker will need to be sent to Amina for repair.

Very low output after speaker passes electrical tests:
> With no audio signal applied, lightly push the panel in and out at its center. Listen carefully for rubbing voice coils on the driver, which may sound like scratching. This may indicate the speaker has been over driven and subsequently damaged. The speaker will need to be sent to Amina for repair.

Distortion at higher volume levels:
> Diffuse source panel loudspeakers of this type have an extremely fast response, articulating the signal from your audio system very accurately. Take your system back to the bare minimum (amplifier, source and speakers) to eliminate distortions introduced by other components.
> When using your amplifier at maximum power levels, or if the input of your amplifier is being overloaded, the signal level may be 'clipping'. With some conventional speakers this may not be evident, but with a diffuse source panel speaker you are much more likely to hear the distortion. Consider adjusting or upgrading your system.

Specifications

Model Number	AIW350E
Dimensions	17 3/4" x 13 5/8" x 1 5/8" (450mm x 345mm x 40mm)
Weight	2.6lbs (1.2kg)
Nominal Impedance	6 Ohms
Frequency Response	110Hz - 22kHz (-6dB)
Sensitivity (2mm plaster/mud skim)	84dB 1m/ 2.83Vrms
Connection	Twin blue butt-splice crimp terminal (suitable for 1.5mm2 - 2.5mm2 / 16-14AWG cable thickness)
In-line protection unit	APU2 / APU-RS8
Fixing requirement	Amina BackboxFS / BackboxSW / Basic fixing kit
Power Handling	40W (continuous) ; 80W (max)
Manufacturer warranty	10 years

Specifications: APU2

Model Number	APU2
Dimensions	190 x 100 x 42mm (7 1/2 x 4 x 1 5/8")
Weight	0.5kg
Filter type	Passive 3rd order high pass. 20dB/octave slope, -3dB at approx. 70Hz with AIWX connected
Fuse protection	Self-resetting, current sensing type. Fuse threshold set via internal jumpers
Compatability	Suitable for use with Amina AIW1X, AIW2X, AIW3X, AIW3X/S200, AIW4X and AIW5X
Number of channels	2
Connection type	1x Springcon® 4 pole connector per channel. Connector carries input and output for each channel
Maintenance requirements	Protection fuses can be set by the installer if necessary. Repeated tripping of fuses may require fuse replacement by the manufacturer to ensure optimal speaker performance

For multi-channel speaker sytems, Amina recommend the **APU-RS8**, an 8 channel, in-line rack mounted version of the APU2 protection unit. Please contact Amina if you would like further information on this product.

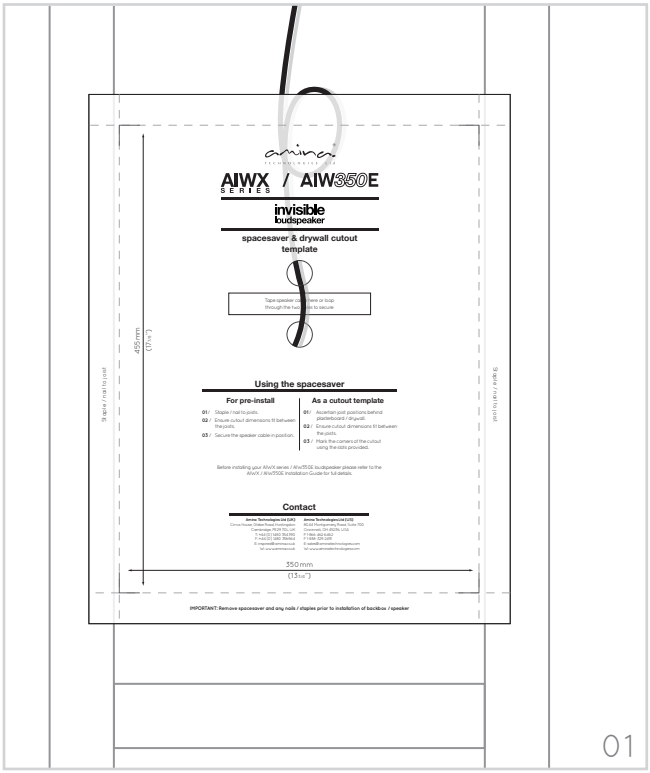
Spacesaver information

01 Using the spacesaver for pre-install

The AIW350E spacesaver is designed to be pinned/taped to joist work prior to the plasterboard/drywall being fitted.

Your speaker cable can then be secured to the spacesaver using the holes provided.

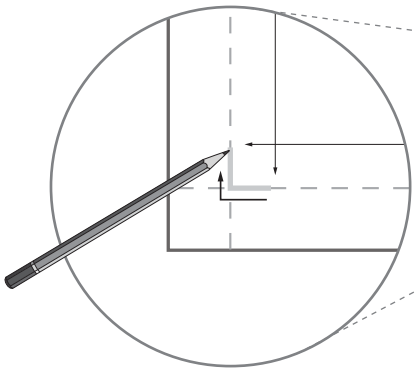
There are two ways to secure the speaker cable in position. The first is to pull the cable through one (or both) of the holes and tape in position.
The other method is to again pull the cable through the two holes, loop and tie the cable in position.

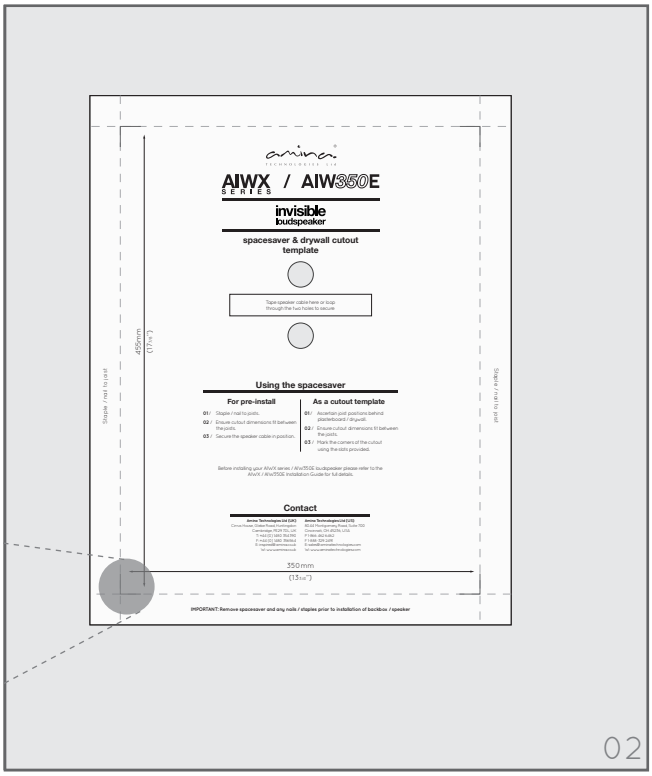

AIWX / AIW350E
invisible loudspeaker
spacesaver & drywall cutout template
Using the spacesaver
For pre-install
As a cutout template
350mm
IMPORTANT: Remove spacesaver and any nails / staples prior to installation of backbox / speaker
01

02 Using the spacesaver as a cutout template

For installations where the plasterboard/drywall is already in place, the spacesaver can be used purely as a hole cutout template.

Carefully mark the corners of the cutout using the four slots provided.




AIWX / AIW350E
invisible loudspeaker
spacesaver & drywall cutout template
Using the spacesaver
For pre-install
As a cutout template
350mm
IMPORTANT: Remove spacesaver and any nails / staples prior to installation of backbox / speaker
02

Warranty information

Limited Warranty:

The Amina AIW350E is designed to operate reliably for many years. Correctly installed in accordance with these instructions, Amina warranties the AIW350E against defective materials and workmanship for a period of five years in commercial applications and ten years in residential applications.

At the end of the speakers useful life and in compliance with the European directive on waste electrical and electronic equipment (WEEE), this product is to be returned to your supplier, or directly to Amina for recycling. If you have any questions please contact Amina Technologies Ltd.

* Please refer to our full warranty statement for details, available on our websites, or alternatively contact us via email on any of the above addresses.

Important Note: This product does not comply to European Construction Products Directive EN 54-24 and therefore must not be used in European voice evacuation systems.

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